Remarks

This is filed in response to the Office Action mailed March 29, 2004, citing objection to several of the claims under 35 USC 112 and rejecting all but claim 7 as obvious over Csipkes (US 5,543,915) and Peters (US 5,077,806). Claim 7 is indicated as allowable, if rewritten as an independent claim and corrected to remove subject matter cited as objectionable under 35 USC 112. The claims are amended as shown above to remove all grounds for objection and rejection.

At the outset, the claims are amended to remove the parenthetical expressions identified by the Examiner in ¶ 1 of the Office Action as objectionable. No new subject matter is added and antecedent basis is preserved, if not improved.

In response to ¶ 2 of the Office Action, a Preliminary Amendment filed on January 27, 2004 had already corrected the claims numbering in the manner suggested by the Examiner. The undersigned invites the Examiner to telephone if a duplicate of that amendment is required for the PTO files.

Responding to ¶¶ 3 – 4, the neither Csipkes, Peters, nor the combined teachings thereof, render the subject matter of claims 1 – 6, 8 – 19 and 29 – 37 unpatentable. Claim 1, for example, is directed to improvements in a machine vision method of thresholding a first image. The improved method includes performing each of the following steps, for each of at least selected neighborhoods of plural pixels in the first image: generating a defocused value that is a statistical function of values of the plural pixels in that neighborhood; comparing that defocused value with one or more first thresholds and generating, based on that comparison, a first neighborhood threshold result for that neighborhood, wherein the one or more first thresholds are held constant for all neighborhoods; and comparing that defocused value with one or more second thresholds and generating, based on that comparison, a second neighborhood threshold result for that neighborhood, wherein the one or more second thresholds vary in accord with a region of the image in which that neighborhood is located.

Claim 8 similarly recites an improved a machine vision method of thresholding an image. The improvement of that claim is characterized by, for each of at least selected groups of plural pixels in a first image: generating a defocused value that is a statistical function of values of the plural pixels in that group, comparing that defocused value with one or more thresholds and generating, based on that comparison, a group threshold result for that group.

Claim 32 recites improvements in a machine vision inspection method that includes acquiring a first image and thresholding at least selected pixels in the image on a per pixel basis. The improvement is characterized by digitally defocusing the image by generating, for each of at least selected neighborhoods of plural image pixels in the first image, a defocused value that is an average of values of the plural pixels in that neighborhood, comparing that defocused value with one or more thresholds, and generating, based on that comparison, a neighborhood threshold result for that neighborhood. The method further includes generating for each of at least selected pixels in the first image an additional result that is a function of (i) a neighborhood threshold result for a neighborhood which includes that pixel, (ii) a result determined by thresholding that pixel on a per pixel basis.

Csipkes fails to teach or suggest the invention of any of the pending independent claims. That reference discloses an autfocusing system that utilizes two phases to position an interferometric fringe over a target in an image. As noted by the Examiner, nowhere does that publication teach or suggest generating a defocused value that is a statistical function, e.g., an average, of values of the plural pixels in that a group of plural pixels and comparing that defocused value with one or more thresholds in order to generate a group threshold result. (*C.f.*, pending claims 8 and 32). Nor, does that publication teach or suggest generating and comparing such a defocused value and threshold result for a neighborhood, nor comparing such a neighborhood-based defocused value with one or more second thresholds to generate a second neighborhood threshold result, wherein the second thresholds vary in accord with a region of the image in which that neighborhood is located. (*C.f.*, pending claim 1). Still further, that publication fails to teach or suggest generating, for each of at least selected pixels in the first image, an additional result that is a function of (i) a neighborhood threshold result for a neighborhood which includes that pixel, (ii) a result determined by thresholding that pixel on a per pixel basis. (*C.f.*, pending claim 32).

The aforementioned deficiencies of Cspikes are recognized by the Examiner, e.g., at page 4, ¶¶ 3 – 5, of the Office Action.

Peters does not remedy the deficiencies of Csipkes. That reference teaches a machine vision system which uses a pixel counter to sum the number of ON pixels in a digitized video signal to produce a count, where in ON pixel is one whose gray level falls between upper and lower thresholds. Nowhere is Peters understood to teach or suggest generating a defocused value that is a statistical function, e.g., an average, of values of the plural pixels in that a group of plural pixels and comparing that defocused value with one or more thresholds in order to generate a

group threshold result. (*C.f.*, pending claims 8 and 32). Nor, is that publication understood to teach the other features taught in claims 1, 8 and 32. Based on his remarks, e.g., at page 5 of the Office Action, the Examiner appears to have recognized these deficiencies: the Examiner argues, instead, based on supposition from Peters' use of two thresholds; *see*, column 5, lines 38 – 55. However, there is no factual basis in Peters' or Csipkes for such supposition.

In view of the foregoing, the cited references are fail to teach or suggest the subject matter of claims 1, 8 and 32 – not that of the other claims, which depend thereon. The Applicant therefore requests that the Examiner reconsider and withdraw his rejections, so that this application can be passed forward to issuance.

Respectfully submitted,
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